Risks after “eradication” (of wild virus)

… and what do they imply ?

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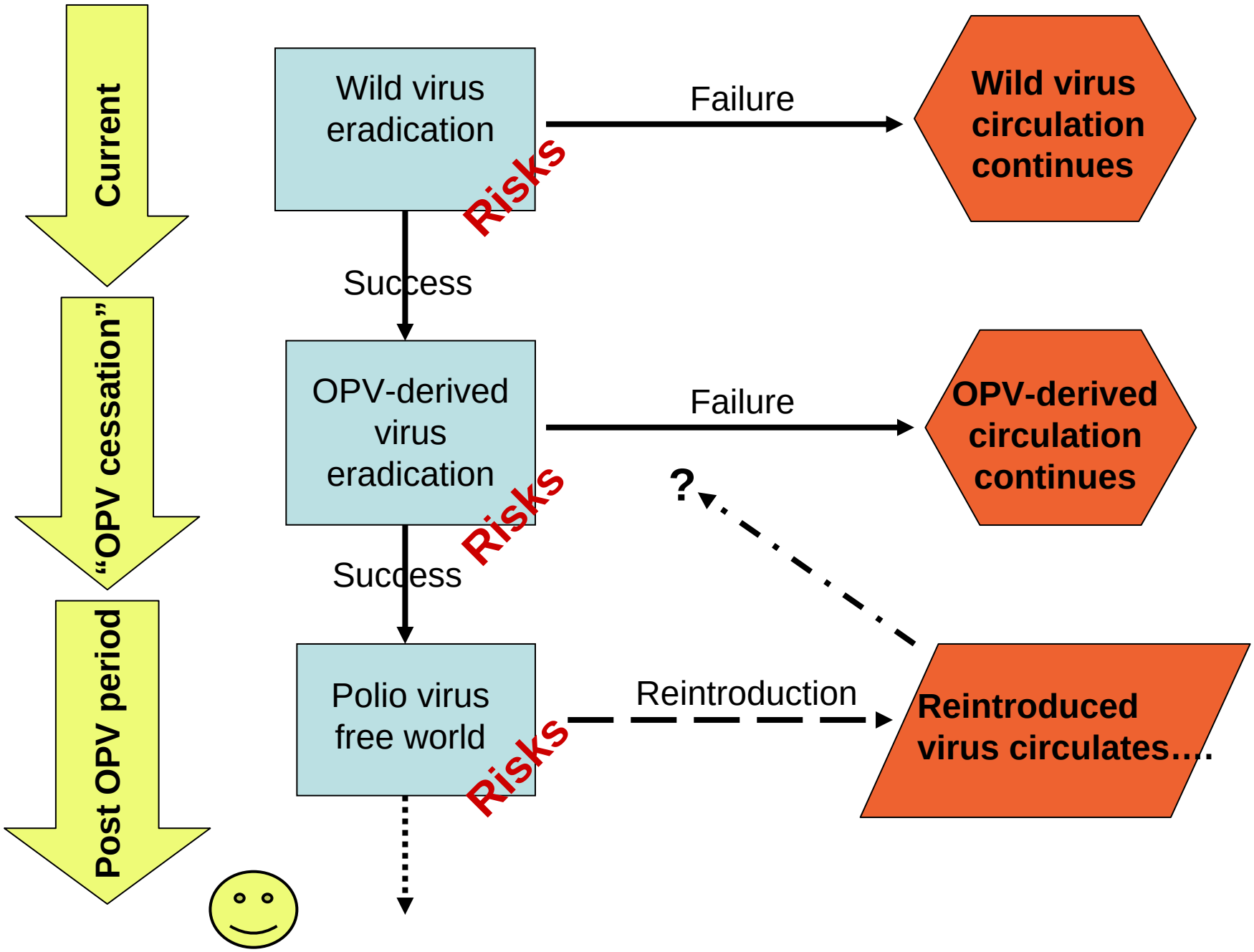

Current
"OPV cessation"
Post OPV period
Wild virus eradication
Failure
Wild virus circulation continues
Risks
Success
OPV-derived virus eradication
Failure
OPV-derived circulation continues
Risks
?
Success
Polio virus free world
Reintroduction
Reintroduced virus circulates….
Risks

“Risks” (threats… challenges…)

- Funding
- Political support
- International coordination
- Vaccine coverage levels
- Maintenance of surveillance (AFP+lab)
- Political instability
- Containment break
- Deliberate release
- Insensitivity of surveillance
- Strategy of stopping OPV
- Persistence of (c)VDPVs
- iVDPVs
- Population mobility
- sIPV
- New vaccine
- IPV costs
- Sites of vaccine production
- Stockpile maintenance
- Dangers of mOPV use

nb: This is just a shortlist of categories !

Successful “eradication” of	Depends upon
All wild polio virus	Money, time, political stability (biology …)
OPV-derived virus	Money, time, political stability, international cooperation; Transmissibility and evolution of OPV derived viruses, containment of iVDPVs, effectiveness of IPV *vs* infection, efficiency of surveillance, etc.…

Territory is largely unknown

- We have no experience in giving up OPV in poorest areas of world….
  - what strategy to “ensure” vaccine derived viruses cease circulation
    - Simultaneous cessation of OPV (generally agreed)
    - Switch to IPV (before?… campaign?…. How long…?)
    - How intense should surveillance be ?
    - When and how intervene if transmission persists ?
  - Important current demonstration in Indonesia

Risk of cVDPV "outbreak"….

- "Mathematical modelling suggests that even with simultaneous OPV cessation there is a 60 – 95 % chance of at least one cVDPV outbreak in the world during the 12 months immediately after cessation with that risk…." (Tebbens et al 2006; Aylward et al, 2006)

- This "chance" is based upon the frequency of recognised cVDPV *disease* outbreaks 1999 – 2005, not on the extent of circulation of OPV-derived viruses (which is extensive)

Risks of IVDPV, or containment break, … or deliberate release

- "… a probability of approximately 4 % of at least one outbreak due to iVDPVs during 20 years…." (Tebbens et al 2006)
- Nb this "probability" is based upon known iVDPVs to date – but how many more are out there ?

- Containment break risk is a function of compliance, regulations and location of premises….

- Deliberate release risk cannot be estimated

Premise, conjecture and implication

- Epidemiology (eg transmissibility and vaccine efficacy) of polioviruses differs between populations
- Stopping circulation of OPV-derived viruses is likely to be most difficult in those areas where it has been most difficult to stop wild virus transmission
- There is a need for multiple studies and demonstration projects of OPV cessation and IPV contributions *in / relevant to those predictably most difficult areas*
    - *What is an adequate model for Bihar…?*

Can mOPV be used safely after eradication of wild virus ?

- High likelihood that mOPV would spread, evolve (revert), and lead to further cVDPV strains if introduced into a large susceptible population….

  (this is based on intuition !)

Future of IPV

- The extent to which IPV would be used in future, and its effectiveness against infection in poor countries, is unclear, but it is likely to be used very widely,…. possibly even universally.

- Failure to prepare for this would compromise the programme –
  - Major issues
    - Formulations
    - Costs
    - Vaccine “strain” – eg sIPV
    - Production safety – location and containment

    - Strategies (selective, universal… schedule ?)

Plan(s) B ?

- Ultimate success (a world with no circulating polioviruses) may or may not be achievable

- If not, what happens ?
  - What are options (under various scenarios)
  - Who decides ?
  - When ? – what are criteria ?

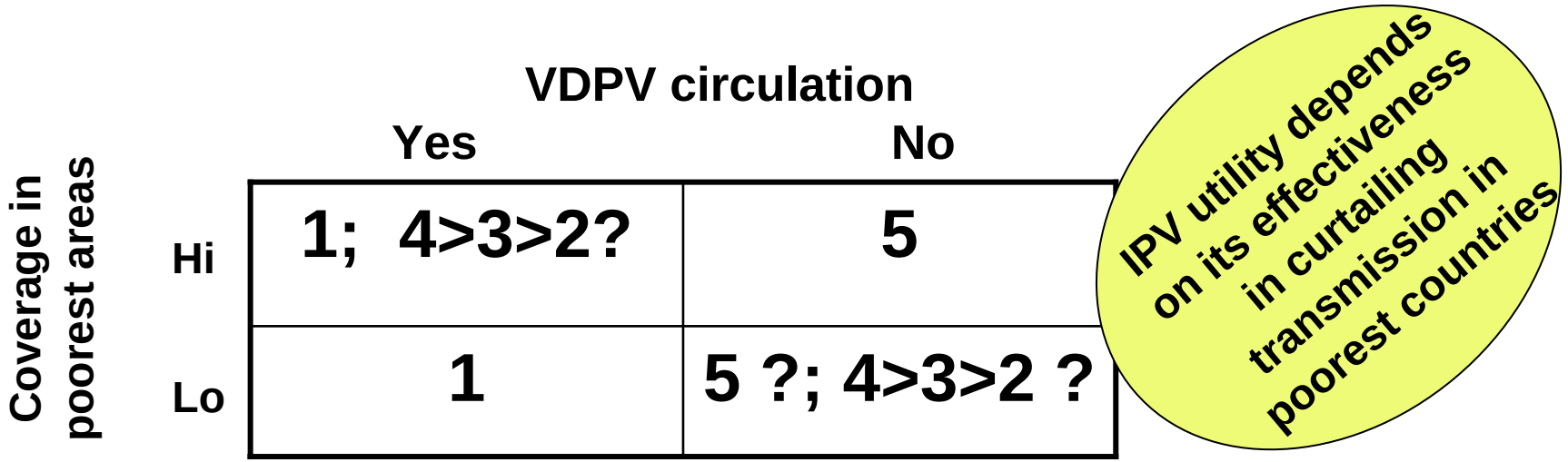
  - And what are the broader implications, for public health

Benefits ….

- Millions of kids can walk ….
- But - any populations with low vaccine coverage are dangers to polio programme *and setbacks for EPI and all public health*
- If polio programme energy and resources could (help) solve this problem – *everyone* would win

Options post eradication of wild virus

1. Continue OPV indefinitely
2. Universal IPV even if produced in high risk settings
3. Universal IPV produced in low risk settings
4. Universal IPV made from safer strains
5. Targeted IPV use in “high risk” settings



Recommendations *(inter many alia)*

- Presentation and analysis with appropriate denominators to estimate “true” frequency of iVDPV and cVDPV *infections*, not just cases….
- *Multiple* studies and demonstration projects of OPV cessation and IPV contributions which are *relevant to the world’s most difficult areas*
- Arrange for large volume production of *cheap* (really cheap), *safe* (made with Sabin strains, or safer…), *appropriate* (ideally formulated as combinations OK for developing countries) IPV vaccines
- Support GAVI’s goal of *90 % routine coverage everywhere by 2010*